23. (New) A nucleic acid encoding for human semaphorin 6A-1 as recited in Claim 22, wherein the nucleic acid sequence has a sequence homology to the nucleotide sequence of SEQ ID NO:1 or SEQ ID NO:3 of greater than about 80%.

24. (New) A nucleic acid comprising a sequence which hybridizes under stringent conditions to the nucleic acid sequence of Claim 23.

25. (New) A nucleic acid comprising a nucleic acid which encodes a protein having a semaphorin domain and hybridizes under stringent conditions to sequence SEQ ID NO:1 or SEQ ID NO:3 of Claim 22.

26. (New) A protein comprising a protein encoded by SEQ ID NO:1.

27. (New) The protein of Claim 26, further comprising a substitution thereto, a deletion thereof or an addition thereto of single amino acids or short amino acid sections.

B1

28. (New) The protein of Claim 27, wherein the protein is capable of binding to a member of the Ena/VASP family of proteins.

29. (New) A protein comprising a protein encoded by SEQ ID NO:3.

30. (New) The protein of Claim 29, further comprising a substitution thereto, a deletion thereof or an addition thereto of single amino acids or short amino acid sections.

31. (New) The protein of Claim 30, wherein the protein is capable of binding to a member of the Ena/VASP family of proteins.

32. (New) A protein comprising the amino acid sequence of SEQ ID NO:2.

33. (New) A protein comprising the amino acid sequence of SEQ ID NO:4.

34. (New) A protein comprising a protein encoded by the nucleic acid sequences of Claim 22.

35. (New) An antibody that binds to the protein of Claim 32.

36. (New) An antibody that binds to the protein of Claim 33.

37. (New) An antibody that binds to the protein of Claim 34.

38. (New) A composition comprising the protein of Claim 32 and a pharmaceutically acceptable carrier.

39. (New) A composition comprising the protein of Claim 33 and a pharmaceutically acceptable carrier.

40. (New) A composition comprising the protein of Claim 34 and a pharmaceutically acceptable carrier.

B1 Cont.

41. (New) A composition comprising the nucleic acid of Claim 22 and a pharmaceutically acceptable carrier.

42. (New) A composition comprising the nucleic acid of Claim 23 and a pharmaceutically acceptable carrier.

43. (New) A composition comprising the nucleic acid of Claim 24 and a pharmaceutically acceptable carrier.

44. (New) A recombinant vector comprising at least one copy of a nucleic acid sequence according to Claim 22.

45. (New) A recombinant vector comprising at least one copy of a nucleic acid sequence according to Claim 23.

46. (New) A recombinant vector according to Claim 44 wherein the vector is a eukaryotic vector.

47. (New) A recombinant vector according to Claim 45, wherein the vector is a eukaryotic vector.

48. (New) A cell transformed with the recombinant vector of Claim 44.

49. (New) A cell transformed with the recombinant vector of Claim 45.

50. (New) A method comprising administration of the protein of Claim 26 to an animal or a human in an amount effective to modulate differentiation, apoptosis, cytoskeletal stabilization, plasticity or neurite growth.

B1 Cont.

51. (New) A method comprising administration of the protein of Claim 29 to an animal or a human in an amount effective to modulate differentiation, apoptosis, cytoskeletal stabilization, plasticity or neurite growth.

52. (New) A method comprising administration of the protein of Claim 34 to an animal or a human in an amount effective to modulate differentiation, apoptosis, cytoskeletal stabilization, plasticity or neurite growth.

53. (New) A method comprising administration of the nucleic acid of Claim 22 to an animal or a human in an amount effective to modulate differentiation, apoptosis, cytoskeletal stabilization, plasticity or neurite growth.